UNIVERSITY of GUELPH

CHANGING LIVES IMPROVING LIFE

Department of Mathematics and Statistics

www.mathstat.uoguelph.ca

Trigonometric Identities

$$\sin^2 x + \cos^2 x = 1$$

$$\tan^2 x + 1 = \sec^2 x$$

$$\cot^2 x + 1 = \csc^2 x$$

$$\cos(2x) = \cos^2 x - \sin^2 x$$

$$\sin(2x) = 2\sin x \cos x$$

$$SOH - CAH - TOA$$

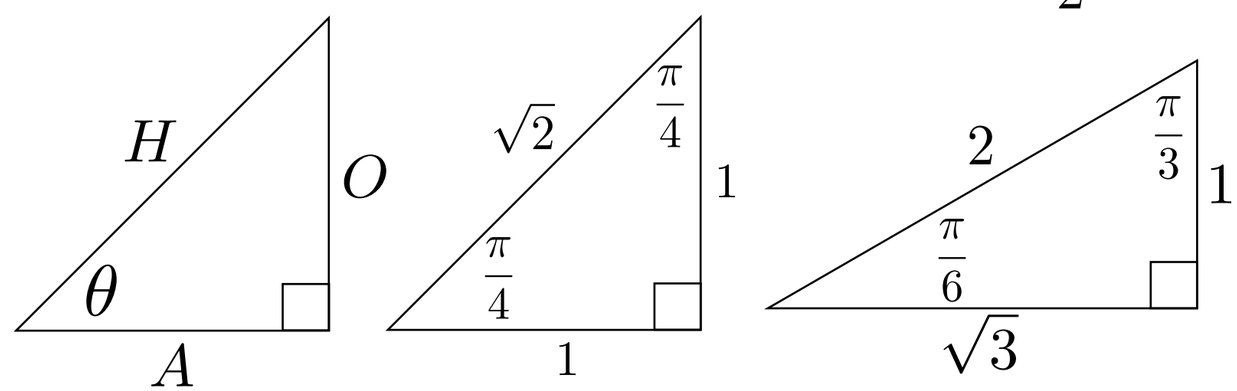
π radians $= 180$ degrees

r radians $= \frac{180r}{\pi}$ degrees

d degrees $= \frac{\pi d}{180}$ radians

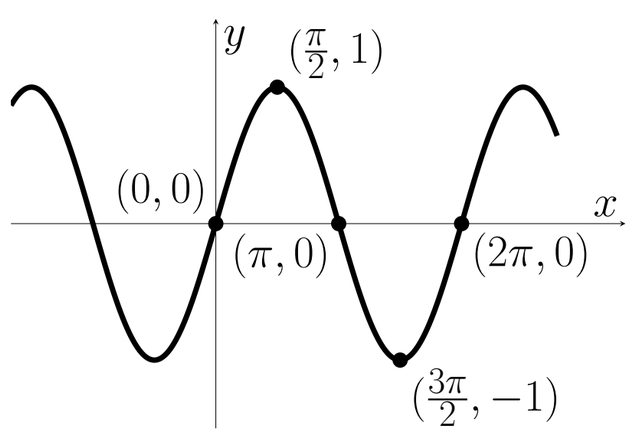
$$\cos^2 x = \frac{1+\cos(2x)}{2}$$

$$\sin^2 x = \frac{1-\cos(2x)}{2}$$

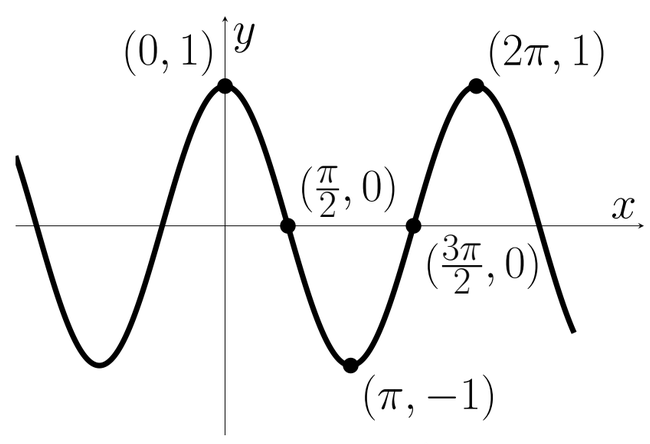


Trigonometric Functions

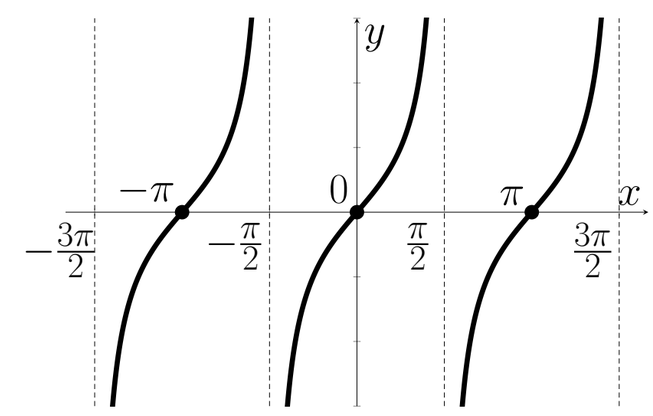
$y = \sin x$



$y = \cos x$



$y = \tan x$



Reciprocal

$$\csc x = \frac{1}{\sin x}$$

$$\sec x = \frac{1}{\cos x}$$

$$\cot x = \frac{1}{\tan x}$$

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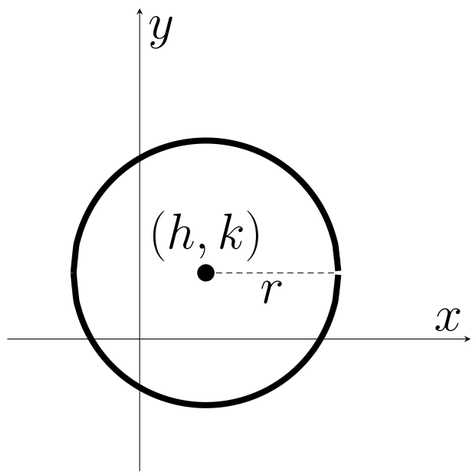
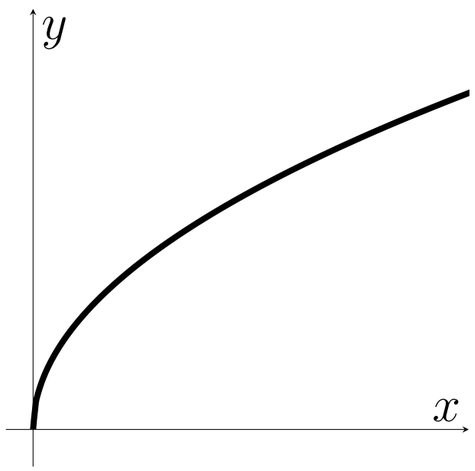
Have an idea for a formula card? E-mail us at mathstat@uoguelph.ca!

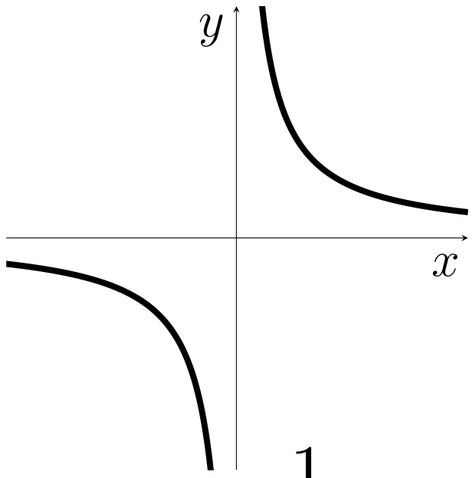
Common Curves



$(x-h)^2 + (y-k)^2 = r^2$



$y = \sqrt{x}$



$y = \dfrac{1}{x}$

Exponents

$x^a x^b = x^{a+b}$ $\quad (x^a)^b = x^{ab}$ $\quad x^{\frac{1}{n}} = \sqrt[n]{x}$ $\quad x^0 = 1$

$\dfrac{x^a}{x^b} = x^{a-b}$ $\quad x^{\frac{m}{n}} = \left(\sqrt[n]{x}\right)^m$ $\quad x^{\frac{1}{2}} = \sqrt{x}$ $\quad x^{-1} = \dfrac{1}{x}$

Factoring

To solve $ax^2 + bx + c = 0$ for x

(1) factor (if you can), or

(2) use $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a^2 - b^2 = (a-b)(a+b)$

$a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$

$(a+b)^2 = a^2 + 2ab + b^2$

$(a+b)(c+d) = ac + ad + bc + bd$